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**Notice of Allowability**

Application No.

10/662,170

Applicant(s)

LI ET AL.

Examiner

Ted Kim

Art Unit

3746

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to \_\_\_\_\_.
2. ☒ The allowed claim(s) is/are 1-20 and 22.
3. ☒ The drawings filed on 06 February 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None . of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                       |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                               |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance              |
|   | 9. <input type="checkbox"/> Other _____.  |

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with George Kap on 1/19/05.

The application has been amended as follows:

#### Claims

- Claim 1 (amended) A method for initiating detonation in a combustible material comprising the step of injecting a jet material into a chamber filled with the combustible material from different directions to create a jet impinging region; generate generating imploding shocks that increase temperature and pressure in the jet impinging region to the point of initiating detonation in the combustible material without using a separate ignition source of another type.
- Claim 3, "combustible" has been replaced by -jet-.
- Claim 4, "gaseous substance" has been replaced by -jet material-.
- Claim 12 (amended) An apparatus comprising a chamber that ~~can be~~ can be filled with a combustible material; a filling port for admitting the combustible material into the chamber; ~~at least one opening in the chamber~~ means for admitting jet

material into the chamber from different directions to create a jet impingement region where imploding shocks are generated ~~imploding shocks~~ for detonation initiation without using a separate ignition source of another type; and an exit opening in the chamber for allowing combustion products from detonation initiation ~~method~~ to exit the chamber

- Claim 20, last line the space after “valve” has been deleted.
- Claim 21 has been canceled as this claim is not believed to be enabled by current material technology.
- Claim 22, “claim 21” has been replaced by –claim 12--.

### REASONS FOR ALLOWANCE

2. The following is an examiner’s statement of reasons for allowance: the prior art of record do not fairly teach in permissible combination the claimed invention. Applicant’s invention is a paradigm shift away from separate igniters to initiate detonation to one where the impinging jets in an impingement jet area are at sufficient pressure and temperature to create imploding shocks to the point of initiating detonation. In the apparatus claim, the “means for ...” language was used as the novelty lies in the functional language, not in the mere structure (i.e. opening) and thus to ensure it being given weight. Igniterless combustion is known per se, e.g. hypergolic combustion by Harp, Jr 3,545,211 (col. 2, lines 48-52) with a shock wave (which appears to be the detonation front). However, there will be no imploding shocks generated as impingement

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of hypergolic fuels will react as soon as they come in contact and thus prevent the fluidic temperature and pressure rise associated with the jet impingement that creates the imploding shocks.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

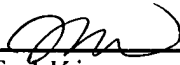
***Contact Information***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 703-872-9306 for Regular faxes and 703-872-9306 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler, can be reached on 571-272-4834.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

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